Claims

What is claimed:

[c1] 1. A vehicle sensor fusion architecture including: A plurality of paired input sensors for sensing vehicle environment, each pair including one sensor from a first band of the electromagnetic spectrum and a second sensor from a second band of the electromagnetic spectrum and each sensor providing an electrical sensor output indicative of the vehicle environment; A time tagging module for tagging each electrical sensor output with the time the sensor information was gathered; and A central fusion module coupled to receive said sensor outputs from a paired input sensor and having a logic capability to process the paired input sensor output to generate a fusion output for providing information characterizing the vehicle environment.

[c2] 2. A vehicle sensor fusion architecture as recited in claim 1 wherein said input sensors comprise a visual camera and a radar sensor.

[c3] 3. A vehicle sensor fusion architecture as recited in claim 1 wherein said central fusion module comprises logic means for combining a plurality of paired sensor inputs from a plurality of signals generated by said paired input sensors.

[c4] 4. A vehicle sensor fusion architecture as recited in claim 3 further comprising a time tagging module so that information data can be extrapolated and interpolated to the same point in time for a fusion action combining information to take place.

[c5] 5. A vehicle sensor fusion architecture as recited in claim 4 further comprising a current track file generator, and a comparator for comparing the time tagged data to the current track file data, and an updating means for updating the track files if a match is found.

[c6] 6. A method for generating information characterizing the environment around a vehicle comprising the steps of: Designating a plurality of information gathering zones around the

vehicle; Selecting a first sensor type from a first band portion of the electromagnetic spectrum and selecting a second sensor type from a second bank of the electromagnetic spectrum; Deploying at least one A sensor from the first sensor type and one B sensor from the second sensor type in each information gathering zone; Time tagging information generated from the A and B sensors so as to indicate when the information characterizing the ambient was gathered; Selecting information A (t1), characteristic of a time t1, from sensor A; Selecting information B (t2), characteristic of a time t2, from sensor B which corresponds to substantially the same time as information A (t1); and Fusing information A (t1) and B (t2) so as to characterize a target in the environment of the vehicle.

[c7] 7. A method for generating information as recited in claim 6 further comprising the steps of: Selecting from the steps of interpolating and extrapolating the information of B (t2); Interpolating the information of B (t2) to be at the same time tag moment as A (t1); and Extrapolating the information of B (t2) to be at the same time tag moment as A (t1).

[c8] 8. A method for generating information characterizing the environment, including a target, around a motor vehicle including the steps of: Designating four information gathering zones A, B C, and D around the vehicle; Selecting a radar sensor type and selecting a camera sensor type; Deploying one radar sensor and one camera sensor in each information-gathering zone A, B, C, and D; Time tagging information generated from the radar and camera sensors so as to indicate when the information characterizing the target was gathered; Selecting information A (t) from the radar sensor; Selecting information B (t) from the camera sensor which corresponds in substantially the same time to information A (t); and Fusing information A (t) and B (t) so as to characterize the target in the environment of the vehicle.

[c9] 9. A method for generating information as recited in claim 8 further comprising the steps of: Selecting from the steps of interpolating and extrapolating the information of B (t); Interpolating the information of B (t) to be at the same time tag moment as A (t); and Extrapolating the information of B (t) to be at the same time tag moment as A (t).

Sensor Fusion System Architecture